

AN ESSAY
ON
THE PROXIMATE CAUSE
OF
ANIMAL IMPREGNATION;

BEING
THE SUBSTANCE OF A PAPER
READ AND DISCUSSED IN
THE MEDICAL SOCIETY AT GUY'S HOSPITAL, IN OCTOBER 1799.

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P R E F A C E.

ON speculative subjects every one may exercise his thoughts, and give to them whatever cast and coloring his train of ideas may enable him to paint ; and on the happy turn of his conceptions, and the adroit mode of their application, must depend the reception they will have with those who give only a superficial examination ; and the more obscure and complicated the subject of speculation, the more will those minds be bewildered by the speciousness of imagery.

We need not then be surpris'd at the many converts to the theories on animal impregnation adopted and promulg'd by Dr. Darwin and Dr. Haighton : the former physiologist deludes by the brilliancy of his fanciful ideas, and the latter by the plausibility of his experimental speculations. In the following few pages it is the sole intention of the author to prove by argument and fact the inefficacy of the doctrines taught by the above physiologists, and to all who give exclusively to one sex the power of reproduction.



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AN ESSAY, &c.

To investigate the operations of nature has ever been the honorable motive of the philosophic mind, and every age has produced men who with unwearied application have been eagerly devoted to the elucidation and advancement of science; and to such devotion the world is abundantly indebted for the present highly cultivated state of human knowledge.

Amid the numerous matters subject to physiological inquiry, none stands more eminently distinguished than the investigation of the efficient cause of animal reproduction. The mystery of nature in this wonderful operation has from the earliest period courted the attention of physiologists, and, though experiment and imagination have toiled and fancied through all ages, and opinions have been various and ingenious, the present day still finds the subject unconcluded, and still frets with discordant and imaginary doctrines.

In tracing the process of generation theorists have ranged themselves on three distinct grounds, each of which has had its ardent advocates, and as strenuous opponents. One gives to woman alone the humble office of affording a proper

nidus for the due evolution of the foetus, which according to this theory already exists in the male semen, and requires only a fruitful habitation. Another directly reverses this position; it puts the female in possession of every requisite for the formation of a new animal, and considers the male a mere stimulating engine to call the latent powers of the female into life. The third gives not pre-eminence to either sex, but with the mutual embrace produces a mutual effect; it regards both the male and female as most essentially concurring in the work of reproduction, each affording a something, which, uniting under proper circumstances, becomes the proximate cause of impregnation.

Although every existing theory on the reproduction of animals is reducible in its principle to one of the above grounds, the warm and fertile imagination of speculative minds has led to almost innumerable modifications, each theorist assuming his fundamental position, and forming his deductions in manner and respect to the direction of his fancy.

It is not the intention of this essay to canvass the peculiar turn and modification of every theory; to ascertain the proximate cause of impregnation requires only an examination of some few theories embracing the different grounds above specified as the principles of investigation.

But ere I launch into the wide speculative field of generation it is necessary to ask, if the existence of a corpus luteum is to be regarded as the test of impregnation? This point it is more particularly requisite to decide, as, by a certain

physiologist, (Dr. Haighton,) and whose whole theory hinges on the question, it has been more particularly assumed that the positive test of impregnation having been effected, is—the existence of a corpus luteum; his plausible experiments and turn of theory have led him to this assumption; but perhaps it would be more in character with truth, and more consonant with the simple and general operation of nature to deny such appearance as the direct evidence of impregnation; for the sexual act alone, when the communication between the uterus and the ovarium is destroyed, is capable of exciting the proper action of the vesicle, and of occasioning the dislodgment of its contents, and, in consequence, of forming a corpus luteum. But even the sexual act is not necessary for this. The keen dispositions of some virgins (not daring to indulge as nature would direct) have impelled them to seek for gratification by means unnatural and unworthy of them; and these means, by exciting the uterine system, have occasioned the formation of a corpus luteum. This I assert on the authority of Professor Blumenbach, who has observed that the ovaria of females may be affected by unnatural means; that corpora lutea have not been found in virgins until they have arrived at puberty; and that they more frequently appear in hysterical girls, whose dispositions, I conceive, being more irritable, are more susceptible of excitement, and more prone to sensual considerations.

Mr. Saumarez in his “new system of physiology” has sanctioned the opinion of professor Blumenbach; and a

section of Dr. Denman's "introduction to the practice of midwifery" seems, in my mind, strongly to corroborate the idea: it treats of an habitual painful menstruation attended with the expulsion of a membrane similar to the *decidua*; this, some single, as well as married women, are subject to. The Dr. knows not how to account for it. He says, "there does not appear any external peculiarity of constitution, or disposition to any other complaint in many of those who have been liable to the formation of this membrane, which is in fact a proper office performed at an improper time." This is giving no explication. Moreover, the Dr. has gone through nearly the whole materia medica without effect, to alter "the state of the glandular system in general, or that of the uterus in particular." Where this membrane (the decidua) is expelled in unmarried women *, may not its formation be in consequence of the stimulus given to the uterine system by their unnatural gratification of their sensual appetites, and would not corpora lutea be found in the ovaria in all such cases? This latter question I wish to urge, as Dr. Denman has advanced, that "no woman in the habit of expelling this membrane has been known to conceive."

If the existence of a corpus luteum is to be regarded as the test of impregnation having been effected, how was it

* And in married women also; for I imagine with them that the membranous expulsion may be the consequence of sovereign habit, long formed previous to their wedded state: this might be ascertained by questioning them as to the existence of this abortive malady during their single condition.

in the many experiments made by Dr. Haighton, wherein he divided the fallopian tube, and yet the evolution of the ova took place, that in no one instance those *impregnated* ova went on in evolution, producing extra-uterine foetuses? Perhaps it may be answered, that sufficient time was not allowed to ascertain whether or not such effect would have been produced; but if experiments are to be instituted with the end of establishing certain theories, or of endeavouring to prove the insufficiency of others, every latitude of time should be given, and every varied mode of investigation embraced, which can fully and fairly tend to the exposition of truth. Let, then, such experiment be made; and if the result should disclose the existence of extra-uterine foetuses, then may the experimental physiologist with much speciousness triumphantly declare, that the female alone possesses the supremely elevated office of forming and perfecting the reproduction of her species, and that the male is a mere mechanical stimulator to lead up the proper play and harmonizing action of her generative organs! But, if by such conduct the existence of extra-uterine foetuses cannot be established, how is the author of the sympathetic doctrine of reproduction to prove that an evolved ovum, or vesicle, actually contains the rudiments of a foetus? His experiments, as hitherto made, prove only that the sexual act is capable of extricating the ovum, or vesicle, from its ovarian habitation.

It ought also to be urged in opposition to the hypothesis of a corpus luteum standing as the test of impregnation,

that after coition more corpora lutea will sometimes be found than foetuses, without any violence having been offered to the female. This fact appears incontestibly to prove that the ova can be evolved by the sexual act alone, and, consequently, that corpora lutea can never be esteemed the criterion of impregnation.

Seeing then, from the afore statement, that the existence of corpora lutea does not constitute the evidence of impregnation, I shall now proceed to touch on the subject of generation.

Of those philosophers who alledge that the rudiments of an animal are essentially and alone contained in the male semen, Leeuwenhoek ranks the foremost. By the aid of his *highly* magnifying microscope, and his ingenious imagination, he saw, or thought he saw, myriads of animalcules floating in the feminal fluid; and so numerous and atomical were these men in miniature that many millions inhabited a drop of semen, which in itself possessed not the space of the smallest grain of sand, whose diameter cannot equal the hundredth part of an inch!

The extreme minuteness of matter no one will deny; and no one will deny to Leeuwenhoek an extreme acuteness in vision. I am at a loss which most to admire, his magnifying glass, or his magnifying imagination. But on this alone rests not the evidence of his minute researches: in tracing the fibrils of a nerve, by the help of his microscope, he found the *smallest* fibre in possession of a space equal to the diameter of the 32,000th part of a hair! This is in-

deed splitting a hair very dexterously. But to return to the animalcules. After being assured of the existence of these little men, we are next entertained with a description of their shapes and motions, and are told how far they will travel in the space of half an hour. I have not calculated the exact distance from where an animalcule may be set down by the male to the ovary, consequently I am unable to ascertain how long it may be journeying thither ; but when arrived, it enters a vesicle by a valvular opening, which then closing, prevents the intrusion of a second gentleman, who may wish to take up his residence in the same apartment as his friend ! Shall I go on with this theory, or consider it only “ a cock and a bull story ” ? I have traced an animalcule to the ovary, there let it rest, and let a requiem be sung to the dreams of this theorist. However, it is at least certain that Leeuwenhoek saw *something* floating in the seminal fluid ; and this something, Buffon tells us, did not consist of animalcules, but of organic particles, which, according to his theory, were destined to effect impregnation ; but not alone, nor in a like manner.

A modern writer, (Dr. Darwin,) who denies that the female has any share in the actual production of an animal, tells us that an embryo is not a new being, but merely an elongation of its parent, “ a simple living filament, the extremity of a nerve of loco-motion,” launched from the male, and endowed “ with certain capabilities of irritation, sensation, volition, and association ; and also with some acquired habits or propensities peculiar to the parent ;” and,

“ by the stimulus of the surrounding fluid, in which it is received from the male, it may bend into a ring, and thus form the beginning of a tube :” this annular tube then absorbs the enveloping nutritive fluid, and, by degrees, assuming new irritabilities and sensibilities, is modelled into the figure of its parent * !

“ The Poet’s eye in a fine frenzy rolling,
Doth glance from heaven to earth, from earth to heaven ;
And as imagination bodies forth
The form of things unknown, the Poet’s pen
Turns them to shape, and gives to airy nothing
A local habitation and a name.”

So fond is this author of his living filament, and so eager is the flighty wildness of his conception, that he even imagines the whole animal and vegetable kingdoms originally to be formed from one and the same simple filament ! This is a sublime idea, and, like the rest of the theory, truly worthy the elegant and lofty fancy of a poet ; but philosophy cannot countenance imaginary works, or keep pace with the brilliant visions of poetry.

Thus much of the authors who assert that the female offers nothing essential in the important work of generation. That the male has the sole power of propagating, that he

* It appears that Dr. Darwin in his *Phytologia* has new ideas on the subject of impregnation, which perhaps are to hold a footing in the next edition of his *Zoonomia*.

alone possesses the efficient matter for reproduction, is a position which cannot be admitted. There are objections to this theory, in my mind, too formidable to be resisted, though confronted by the microscopic observations of a Leeuwenhoek, and the fertile fancies of a Darwin. But it is not requisite here to bring forward the objections, as what will be advanced in opposition to the supporters of the sole prerogative of the female in generating, will, in many points, equally apply to the vindicators for that peculiar privilege in the male.

I now come to that system of generation which places the female in the power of propagating without the material interference of male semen. This theory, like the former, had its advocates in former times, and still finds men willing to defend it. A celebrated physiologist of this day (Dr. Haighton) informs us, "that the semen first stimulates the vagina, os uteri, cavity of the uterus, or all of them;" and that *by sympathy* the ovarian vesicles are perfected, (then containing the rudiments of the foetus,) and the rudiments of the foetus are conveyed by the fallopian tubes into the uterus, where the necessary preparations are made for perfecting their formation and growth. By this theorist it is concluded that the contact of the male semen with a vesicle of an ovary is not necessary to effect impregnation; and on the following circumstances he rests his conclusion. Because, (let it be observed that this author regards the existence of a corpus luteum as the test of im-

pregnation having been effected) on the division of one of the fallopian tubes before coition, the corresponding ovary, after the sexual act, bears *the marks of impregnation*: because the fimbriated extremity of the fallopian tube does not embrace the ovary before *the evidence* of impregnation is present; and because, admitting that the tube has previously come into contact with the ovary, on dividing it, corpora lutea are found, but no foetuses. The above is the ground work of the theory in question.

Let it be admitted that the sexual act can effect the perfection of the ovarian vesicle, and, in consequence, the formation of a corpus luteum; but I deny that impregnation can be effected without the contact of the male semen. But it is asked, how can the semen be brought into contact with the ovary, seeing that the fimbriated extremity of the fallopian tube does not embrace it during coition, or for many succeeding hours? By way of answer, I ask, what proof have we that the tube, at the very time of connexion, does not embrace the ovary? What argues it that it was found in its usual situation a few minutes after coition? Does this deny the possibility of the contact during the sexual act? But physiologists, concerning the actions of the tube, are not very coincident in the relation of their experiments. One tells us (as the author of the theory now under consideration) that in a train of observations on different rabbits, he never found the fimbriæ from the first to the ninth hour post coitum embracing the ovary; another (Mr. Sau-

marez) affures us, that in repeated experiments he has feen the fimbriæ effect this important work in not more than two hours and a half after coition; and a third (the late Mr. Cruikfhank) afferts that he has found the tube tightly embracing the ovary in a rabbit highly difpofed to receive the male, but which had not been permitted to copulate.

The actions of the tube I fhall reconsider hereafter; and now go on with the theory at this time under obfervation.

Allowing time for the tube to embrace the ovary, Dr. Haighton then divided it, and on a fubfequent examination found corpora lutea in the correfponding ovary, but no foetufes; but on dividing the tube after the ova had been depofited in the uterus, and, after a proper time examining, foetufes were found to exift.

Previous to the diflodgment of the veficles from the ovary, there is no wonder that the divifion of the tube fhould arreft the operations of nature; for dividing the tubes prior to the fexual act produces fuch derangement in the fyftem, as even to deftroy the venereal appetite; and this not unfrequently by the fimple divifion of one tube. But after the depofition of the ova in the uterus, there is no reafon to fufpect that the like violence fhould produce the like effect; for the rudiments of the foetus have then attained their deftined place for their proper evolution and perfection; and the uterus is prepared for their reception, confe-

quently we should not then expect nature easily to be interrupted.

Now it is necessary to know what air of probability there is for supposing that reproduction can be effected without the material assistance of male semen. Analogy teaches us the utter impossibility of it. The semen must essentially communicate with the ovary, or with what passes from it. If impregnation be not effected by the semen of the male being brought in actual contact with the ovum or ova of the female; for why is this fluid cast on the ova of the female frog? for what purpose is it discharged? The male has no external generative apparatus by which to introduce the semen, consequently no stimulus can be given to any part of the procreative system of the female. The author who generates by sympathy, tells us, that as the "effect of sexual communication is so important it cannot be indifferent to the design of nature to what part of the uterine system the semen should be conveyed;" but in the frog we find that to no part of the uterine system it is conveyed; the feminal excitement to call up the chain of sympathizing actions is here wanting, yet the necessary actions are excited, the ova are expelled, and then the semen is required, not *indirectly* to cause impregnation, but *directly* to effect it by actual union; for unless this contact be permitted, no tadpole can be produced, but the ova must undergo those changes to which all dead animal matter is subject; they must undergo the processes of decomposition and putrefac-

tion, and their elementary parts thus separated, must be scattered around, and driven in the "desert air" in search of new elections, to enter into new and varied combinations.

Now I must again ask for what purpose the semen is discharged? It is not applied as a stimulus; and it would be impious to say that the Creator has given it in vain. Here I shall perhaps be told that the frog is not man, and that analogical reasoning is not to be relied on; but however different man may be in structure and appearance to the frog, they alike have certain parts, producing certain and alike secretions, destined to serve particular purposes, to effect which there must be a similitude in action; thus in both there are the gastric juice to effect digestion, the bile to correct the acedcent tendency of food, and to keep up the peristaltic motion of the intestines *, and the semen to propagate the species.

* I have given to the bile the offices commonly applied to it. It is much to be doubted if this fluid has the power of correcting acidity: has it ever been proved, in the healthy condition of the body, that the bile becomes decomposed, so that its mineral alkali may enter into composition with an acid quality? In a state of health the food never becomes acedcent, consequently no corrective is then wanted; and when by deviations from health acedcentcy is produced, the acidity not unfrequently irritates, and occasions diarrhoea; thus proving that the bile has not the supposed corrective quality.

Of late the stimulating office of bile has been denied, and we are informed its proper use is that of separating the fœculent from the nutritious part of aliment: this is

What a train of evidence, embracing facts most positive and indisputable, does that author call up against him, who maintains that the male semen alone possesses the power of stimulating the os uteri and adjoining parts, and that by sympathy generation is effected. When a negro man embraces a white woman, why is it that the offspring is a mulatto? When a male ass copulates with a mare, why does the mule partake of the nature of both? And when dogs and bitches of different species have intercourse, why in appearance do the mongrel whelps claim affinity to both parents? Again, it is a self-evident truth that a child may inherit the disposition to the constitutional diseases of either parent; and shall it be said that it is in the power of *sympathy* to hand down to posterity the contaminated habit of the father? Besides, if the semen be allotted merely to stimulate the uterine system, it would seem a totally unnecessary secretion; for we find that the sexual act is not want-

asserted by Mr. Saumarez in his "new system of physiology." But if it be admitted that the lacteals possess only the aptitude to absorb and retain what is truly nutritive, or at least fit for the formation of blood, the above formal process of separation cannot be required, as the feculent and rejected matter must be left to be pressed on by the peristaltic motion of the intestines: besides, Dr. Saunders, in his treatise on the liver, says, that the bile appears only to glide over the surface of the intestines. It seems fair to infer that bile must have the regular power of stimulating the intestines, as when by any cause its progress into the duodenum is for some time impeded, costiveness is the general consequence.

ing, even to effect those changes, which the semen, by this theory, is only permitted to perform.

To sympathy I am willing to allow much importance in the existence and exercise of a well-regulated animal machine: the “strong connexions, nice dependencies,” so eminently displayed in a living system, in parts *apparently* distinct and unconnected, must irresistibly strike the mind of every one in the least accustomed to contemplate the movements of a living power: and in anatomy we can mostly trace the reason of this harmony of action; for instance, let the knife but point out the extended connexion of the grand sympathetic nerve, and we shall see especially the cause of that harmony and order so conspicuous in visceral action: indeed, so admirable and wonderful appear the utility and extended form of this nerve, that I must regard it almost an emanation of the Deity; in relation to its habitation, it is without origin, and without termination; it is omnipresent and omniscient; it is a world of communication, without beginning and without ending; it is the grand motor of reciprocal and concatenated action; it is the grand harmonizing spring to wheel on the existence of animals; it is the keystone of life! To sympathy belongs all of the power of preserving the proper play of an organized animal machine; but to sympathy nothing is due in the actual production of a new being.

An anonymous author has given out a theory very much resembling that adopted by Dr. Haighton. By the latter

we find that impregnation is effected by the magic touch of the semen on some part of the uterine system; and by the former the sympathizing parts are roused into action by the semen being absorbed and mingled with the circulating fluid, there creating a material change, the ultimate influence of which is directed to the ovaries; and he compares its rapidly pervading influence to the baneful poisons of rabies, variolæ, and syphilis; and like them, he says, from an almost invifible quantity it may multiply in its progress; and further he asserts, “that the female constitution of itself generates within the ovaria the rudiments of the future animal, which the same constitution, afterwards rendered prolific by the feminal fluid of the male, is capable of converting into a living animal.”

This author in reasoning on analogy says, “we shall attend, for the best of reasons, to observations made on brutes, not because of any real analogy between human creatures and brutes, but because what happens in one animal, something similar to it may happen in another.” Thus we find, “for the best of reasons,” this author in one place condemning analogical reasoning, and in another insidiously resorting to it. I have no doubt, this he has done “for the best of reasons,” as he expresses it. In one part he may find it fit, to support his own favourite visions, to run down facts established on analogical researches, and in another it may be equally convenient to frame his tenets by stooping to

analogy. In this he is nowise singular; it has been the subterfuge of every man, who with regard to analogy, has pursued his train of *thinking or writing*.

It has been farcaſtically remarked, that he can be no diſciple of a Newton, or a Locke, who forms his deductions from the *doubtful* premiſes of analogical reſearch; and yet, thoſe who talk thus *learnedly* of the reaſonings of ſuch able men, *have formed* particular theories on particular ſubjects from the ſelfſame data; they have entered on phyſiological inveſtigation by experiments on brute animals, and have made their deductions applicable to the human ſyſtem! Such is the fact, which, when fully known and fairly eſtimated, muſt hold up the flippanſt abuſe of analogy as abſurd and laughable!

It may not be amiſs in this place to dwell a little in vindication of reference to comparative anatomy and phyſiology by way of explaining the general operations of nature in all animal bodies. It has been before obſerved that man and the frog have alike certain parts, producing certain ſecretions, deſtined to ſerve particular purpoſes, to effect which there muſt be a ſimilitude in action; and then the office of the gaſtric juice, the bile, and the ſemen was quoted. But it is not in theſe alone that the frog and other animals are akin to man; there is ſcarcely an action in the human frame, barring the mental operations, which cannot be coupled by almoſt every animal. Moſt animals ſub-

fish like us; they breathe*, and will any physiologist assert that the depuration of their blood is of less importance to them than to lordly man? Will any physiologist, however warm and fertile in imagination, and however wont to *diversify* the *general* laws of nature, hardily assert that the same energies and powers are not displayed in all animals in the wonderful performance of muscular action? Will he say, that the stately movements of the elephant, the agile turns of the flea, and the light steps of graceful woman, are governed and directed by laws dissimilar and distinct? He cannot, dare not indulge in the adoption of such glaring error,—error which must vanish on the least light of consideration, and have habitation only in the vapoired head of its supporter.

“ The gen’ral order since the whole began
Is kept in nature, and is kept in man.”

and,

—————“ the universal cause
Acts not by partial, but by gen’ral laws.”

The same general order, the same universal action in all animated beings, is equally conspicuous in the nervous power, as in muscular contraction. Most animals have their senses as in man, and the impressions on them are

* Though many animated beings are without lungs, all have an equivalent; a something pointing to the same intention; thus the fish is supplied with gills, and the insect with spiracles.

communicated in no way different to man. Injure, or divide a nerve in any animal, and the same effect will universally be produced: compress the fountain of nervous energy, the brain, and the same result will invariably present itself, as when by any accident in man his skull becomes depressed: why then shall it be said that analogical reasoning is too deceptive to be trusted to? Why shall it be doubted, or denied, that the mode of impregnation is alike in all animals? The regeneration of animated beings is the grandest work of nature; and, as the governing laws of animal life are so similar, it may be inferred, and that without any gigantic step of probability, that the *modus operandi* in propagation is the same.

The ingenious Spallanzani, whose experiments must long outlive the phantoms of imagination, incontrovertibly evinces the necessity of the contact of male semen with the generative (the ova) parts of the female; yet he denies that the male furnishes any thing essential in the actual formation of the new being: he asserts that the embryo pre-exists in the female, and that the male semen is wanted only to give it life and motion, which it effects by passing through the pores of the skin, and penetrating the heart, and then powerfully irritating its internal part, by which it is excited to stronger and more frequent pulsations.

To this theory the same objections may be urged as against the former. Moreover, it may be asked, if the tadpole be evolved by the stimulus of the male semen on its heart, is

it not a matter of infinite moment that this stimulus should possess its native vigour to effect the evolution of the animal at the proper period? I should imagine as much; yet this is by no means the case; the Abbé diluted the semen almost to nothingness in comparison to the quantity of the diluent, and still its power remained undiminished; the evolution of the tadpole being as complete, and as soon effected. This seems a strong presumptive proof that the stimulus of the male semen to the heart of the *supposed* pre-existing tadpole is not the engine of evolution, for dilution must weaken the stimulating property of any fluid, and the semen thus diluted could not operate so powerfully in accelerating, according to the imagination of the theorist, the circulation of the tadpole, and thus animating and evolving its whole system. Still to support his stimulating theory, which as yet he deemed but hypothetical, he submitted the matter to the test of an experiment, which, in his opinion, effectually established the validity of his doctrine. Concluding that the stimulating property of any matter must be increased by the application of heat, he warmed the diluted semen, and then fecundified the ova of the frog; and this produced the evolution of the tadpole ten hours earlier than semen of its natural temperature. Such was the experiment, and thence he concluded that the earlier evolution of the tadpole was owing to the increased activity of the semen by the application of heat. The experiment and its effect are not to be questioned; but the conclusion

of the experimenter I deny: the experiment by no means goes to prove that the power of the semen is enhanced by heat; it proves only that the warmer the surrounding body, the sooner the evolution is effected; and the like is continually evinced without the aid of artifice, for it is well known that the warmer the temperature of the atmosphere, the sooner the perfection of the tadpole is attained.

After having traversed the foregoing theories, and having seen their vulnerable points, I am led to conclude that impregnation can only be effected by the seminal fluid of the male having actual contact and union with the ova, or vesicles of the female. Such has been, and now is, the opinion of men possessing at least equal celebrity for talent and industry with the authors of the aforementioned theories.

The celebrated Buffon tells us, that, as the male, so the female, possesses a seminal fluid; that this fluid, in either sex, is the superabundance of nutritive particles, selected from, and corresponding with, every part of the body; and that its admixture from both sexes with parts analogous to each other forms a foetus, which then requires only expansion of its figure. He further says, that the admixture of the seminal fluids is effected by an internal mould, which in frame and structure exactly corresponds with the body in which it is contained; so that generation is effected in this mould by the admirable adaption of the seminal fluids, or organic particles of the male and female.

This mould was not cast by the simple hand of nature,

but by the fertile brain of that able, though frequently ideal naturalist; for his brilliant conceptions, unused to dwell in obscurity, were often wont to "o'erstep the modesty of nature," and, where her paths were too intricate to be explored, to unveil the wished object of his research. But this mould, whose form so beautifully harmonizes with its counterpart, had it existed in nature, might have been the instrument of sad distortions to mankind. Had our father Adam unfortunately been launched into the world wanting an arm, this sport of nature must have been handed down from generation to generation *ad infinitum*; and the cruelties, which at this day vile custom and corrupted taste exercise on animals, would be manifest down to the end of the world; for the cropt and dockt horse must have transmitted his evidences of the folly of man to the foal, and the foal to its progeny.

After having traced through the theory of Buffon, and having contemplated with admiration on its ingenuity, and the elegant diction in which it is conveyed, on taking up another work, I confess I was much damped at finding that the opinions there promulgated, were not the offspring of his own brain, but a borrowed and adopted child; not with a candid acknowledgment adopted, but infidiously stolen and assumed as his own; modified only, and dressed in a luring elegance of language to give it the air and character of novelty. A few words from Dr. Highmore's "History of Generation" will amply testify the truth of my

assertion ; and I shall give them without further comment, concluding that every one must be sufficiently acquainted with the theory of Buffon, to see its other self in the theory of Dr. Highmore. The history of generation to which I allude was published by Dr. Highmore in the year sixteen hundred and fifty-one ; in the fifth chapter of which he says, “ that it is necessary the parts should be made in generation of a matter like to that which maketh them in nutrition ;” and after speaking of the mode in which nutrition is performed, he adds, “ the testicles abstract some spiritual Atomes belonging to every part ; which had they not here been anticipated, should have been attracted to those parts, to which properly they did belong for nourishment. As the parts belonging to every particle of the Eye, the Ear, the Heart, the Liver, Stomach, Guts, the Hand, every particular bone and muscle, &c. which should, in nutrition, have been added (to repair the continual deperdition) to every one of these parts, are compendiously, and exactly extracted from the blood, passing through the body of the Testicles ; and being in this Athanor cohobated and reposit in a tenacious matter (lest being spiritual, and very fine, they should lose their vigor,) at last, pass from the body of the Testicles, by certain Vessels, in which through infinite meanders, it undergoes another digestion and pelicanizing, (as in another place I have shewn). And from thence, being now delivered from all its excrements, and furnished with Atomes, fit for the making of every part and

particle of another Individuall, is treasured up in certain Granaries, till the feed time comes." In the sixth chapter he proceeds, " These feminal Atomes are in the same manner separated by all Vegetables, which are watered in every region by a certain juice, or blood which they attract and suck from their Mother Earth:" and again, " from this quintessence, this juice, are selected parts of the same substance, nature, qualities, and form with the plant, and agreeing with every particle of it, whose blood it is, and from it, is the species propagated." In chapter the eighth, when speaking of the generation of oviparous animals, his words are, " This Egg is compos'd in the Matrix of the Females, and is the product of these feminal Atomes selected from the nutrimentall juice of both." In the ninth chapter, discoursing on the reproduction of viviparous animals, he says, " The principles therefore of these living births, arise as the other, from some selected Atoms by the testicles of both, thrown into the Matrix of the Female." And in the tenth chapter, he accounts for the sex of the foetus in like manner as Buffon.

To conclude: Impregnation I believe to be effected by the feminal fluid of the male having actual contact with the contained matter of the ovum, or vesicle, of the female; and such contact I regard as the almost instantaneous consequence of the ejection of the semen from the male. The ingenious Dr. Smellie, and others, have conjectured, that the semen may be carried to the ovaries by an absorbent

action; and if we reflect on the great power and velocity of absorption, we shall be here led to acknowledge the utility of its agency. The late Mr. Cruikshank, in his incomparable work on the absorbent system, has proved by experiment that the lacteal vessels are capable of conveying their contents the distance of four inches in a single second; so that, allowing to the uterine system the power of absorption, and supposing (to avoid scanty measure) that the semen has full two feet to be conveyed, it would attain that distance in the space of six seconds; and on subtracting three fourths of the velocity in absorption, we should still find the important work completed in less time than half a minute! But having admitted all this, we are told that the fimbriated extremity of the fallopian tube does not embrace the ovary during coition, or for many succeeding hours; this is asserted, but who has proved that the fimbriæ do not envelop the ovary, or a part, during the continuance of sexual intercourse? It is futile indeed to say that they are not in contact with it at that moment, because the fallopian tube is found in its usual situation a few minutes after coition: it might as well be argued, that the penis of a man is not erect in the plenitude of venereal pleasure, because it is found drooping a few minutes after consummation! But at what period is it most likely that the fimbriæ should embrace the ovary? I believe it is generally admitted that the peristaltic motion of the fallopian tube is most active when the vascular turgescency of the uterine system is most con-

spicuous ; this has been proved by experiments on rabbits highly disposed to receive the male, even where no sexual intercourse has been permitted, and in such the fimbriæ have been found tightly embracing the ovaries. Every one must know how high, how exquisite, are the sensations of animals in the moment of coition ; how “ tremblingly alive ” to the keen impulse of desire ! The whole frame “ pants furious,” and is hurried on as it were by irresistible convulsions ; while then the whole body is so animated, and the circulation in general so quickly excited, we must expect that the uterine system, to where the operations of nature are then directed, must largely at that moment partake the disposition to excitement ; and so it is found to do ; the whole link of the procreative parts, from the vagina to the ovaries, is loaded with blood, and wears the appearance of the highest irritation. At such time then it is reasonable to conclude that the fimbriated extremity of the fallopian tube invariably embraces the ovary, and remains there fixed until the semen is applied to the ripening vesicle, which may be effected by the close of copulation.

It is no matter of astonishment that the fallopian tube should resume its usual situation a few minutes after coition : with the end of copulation, ends the motive to excitement ; languor is the consequence, it pervades the whole system, and consequently those effects depending on excitement are no more. After impregnation, for awhile the silent operations of nature appear as at a pause, and the

embryo of future man tarries in the ovary till its evolving habitation is prepared for its reception ; such process occasions new excitement, fresh determinations of blood are consequently effected, and the fimbriæ are recalled to embrace the embryo, and conduct it to the uterus.

Having now shewn what to me appears the process by which generation is effected, I shall only add, that when the union of the conceptive parts of either sex is effected, at such instant I conceive the breath of life to be imparted* ; that *living* and *immaterial* principle, which when superadded to matter, rouses it from its wonted imbecility and inertness, and enables it to evolve and build up the vast and varied fabric of an animal machine ; but how such principle is imparted, and in what manner it renders matter capable of assuming its formative power, I do not presume even to imagine.

* It is certain that all the secretions of an animal have a certain degree of preservative power, as all, when removed from the body, can for a time retain their respective properties ; and after which, they become subject to the processes of decomposition. I say this merely to shew that *something* more than a preserving power is wanted, to cause the organization and evolution of a new being.

THE END.

